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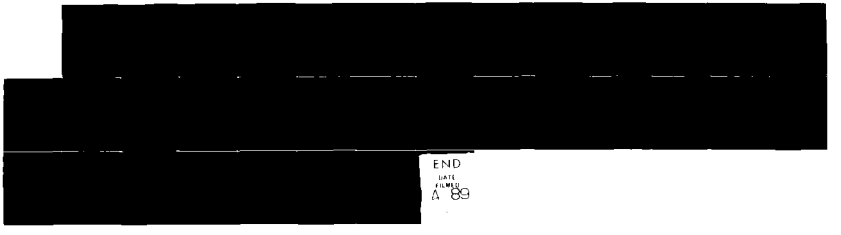

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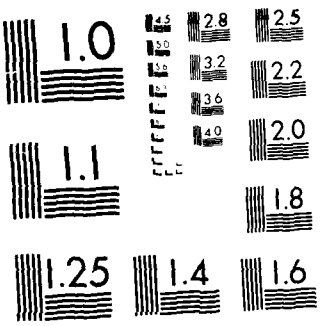
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ALTERNATIVE NUCLEAR EMPLOYMENT POLICY/TECHNOLOGY

Considerations on "Two-Sided" LNOs

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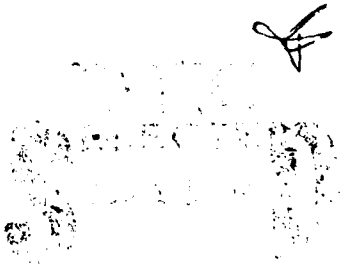

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This paper examines the danger of the Soviets using LNOs, including the case of a nuclear first-use so as to affect the course of a stalled conventional conflict. It assesses implications of this possibility for the design of US LNOs as well as NATO strategy more generally. It considers alternate Soviet ends and means.

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PREFACE

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SECTION 1

INTRODUCTION

An increasing trend in US nuclear weapons policy and planning has been towards the development of limited nuclear options (LNOs). Such options could vary in terms of numbers of weapons used over quite wide ranges. In common, however, they generally (though not in all analyses, as will be discussed later) share some mix of deliberate constraints on geographical scope, weapons used, targets hit, and such like in the attempt to implement the dual criterion--that is to say, accomplishing military goals while minimizing collateral damage (most particularly to civilian population). In the current era, the risk of suffering heavy civilian casualties cannot be effectively limited by either side solely by either preemptive offensive strikes on an opponent's nuclear forces or defenses against them. Limited nuclear options, it is hoped, give an opponent a continuing stake in prudence in designing his own strikes according to dual criterion. They thus can offer some choices for nuclear weapons use besides suicide and surrender. This is particularly important since the most likely occasions for US or Soviet nuclear use are likely to involve, in the first instance at least, battle over some third area, such as NATO Europe or the Persian Gulf.[1]

Perversely, despite recent attention paid to limited nuclear options in concept or as individual strikes, there has been remarkably little analysis of how they would fit into ongoing contingencies. This is

[1] Battle over some third area may lead to limited attacks on the other side's homeland. For example, the Japanese attack on Pearl Harbor was principally designed not to support conquest of Hawaii but to keep the US Fleet from interfering with Japanese acquisition of Southeast Asia.

broadly true both of supporters and detractors of developing US limited nuclear option capability. It is especially so in regard to discussions of Soviet LNOs--the circumstances that might prompt limited Soviet first use of nuclear weapons, the military goals they might hope to accomplish, the possible avenues for constrained Soviet retaliation in response to US LNOs, and the net outcome of a series of two-sided LNO exchanges in an ongoing superpower battle.

Clearly it is possible for a nuclear war to avoid escalating out of control. If only one country has nuclear weapons, as the US did at the end of World War II, control is not really a problem. In the current era, however, the concept of a limited nuclear war with substantially limited damage to civilians has been attacked from both left and right. Those on the left doubt the basic possibility of keeping a two-sided nuclear war limited. Critics from both sides argue, apart from questions about limited nuclear war's physical and operational feasibility, that in any case the Soviets would not go along with it.[2]

Before going further into these arguments, it is important to make two distinctions in limited nuclear options often explicitly or implicitly ignored in discussions of them. First, in this paper, the term "limited" in limited nuclear options refers primarily to the attempt to employ the dual criterion by limiting collateral damage as well as accomplishing some military goal. In this sense then, the US nuclear attack on Japan, though it employed only two weapons, inasmuch as it was aimed directly at cities,

[2] See Desmond Ball, "Can Nuclear War be Controlled," Adelphi Paper #169, IISS, Autumn 1981, and Joseph Douglass, Jr., "Strategic Planning and Nuclear Insecurity," Orbis, Fall 1983.

is not a good precedent.[3] The second point to note is that there are two very different motives for interest in developing dual criterion oriented limited nuclear options:

a) As a Western escalation option in the face of an overwhelming Soviet conventional attack.

b) As a counter (or deterrent) to Soviet LNOs.

While in broad terms many of the same options would be considered in both these roles, there are important differences. In particular, certain key arguments concerning the escalation risks of LNOs are really only relevant to the issue of their first use.

[3] The point here is not necessarily an obvious or universal one. An extensive and much quoted examination of limited nuclear options by the Office of Technology Assessment explicitly did not attempt to limit collateral damage. See OTA, The Effects of Nuclear War, 1979, p. 63.

SECTION 2

BASIC QUESTIONS ABOUT LNOs

Can militarily useful nuclear strikes be made without doing so much collateral damage as to be indistinguishable from an all-out attack? This question is obviously basic to any LNO which, for our purposes, is by definition designed to avoid damage to civilians. The issue has been clouded recently by analyses supporting the "nuclear winter" concept which showed that even a "relatively small" attack could set off drastic climatic effects.[4] This has been interpreted by some as if it were broadly applicable to any significant limited nuclear exchange.[5] In this light, and because it illustrates some more broadly applicable points, it is worthwhile expending some time briefly examining this case.

The "relatively small" nuclear winter case consists of 100 megatons divided among 1,000 warheads.[6] This may be small compared to the larger attacks examined in the nuclear winter study (the base case consists of 5,000 megatons divided among over ten thousand warheads), however, from an LNO point of view, it is relatively large. More important than the number of weapons, however, are the targets chosen. Where the definition of limited nuclear options as used here specifies avoiding casualties to civilians, virtually the opposite is implicitly assumed in the nuclear winter calculations. City centers are the exclusive object of attack in their case as the place with the most combustibles to produce the smoke

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[4] Turco, et al., "Nuclear Winter," Science, 23 December 1983, p. 1290.

[5] See, for example, Anne Ehrlich, "Nuclear Winter," Bulletin of the Atomic Scientists, April 1984, pp. 5S and 14S. See also "The Winter After The Bomb", New York Times, 6 Nov. 1983; and June Wales, Executive Director of the Physicians for Social Responsibility, circular letter of May 15, 1984.

[6] Turco, et al., op. cit., p. 1284.

which is the source of nuclear winter (or rather the smoke blocking sunlight). However, city centers are also the targets where the most people are. Such an attack might kill an estimated 100 million people through direct effects, quite apart from setting off a nuclear winter. It is hardly an example of a limited nuclear option as the term is used here.[7]

The nuclear winter phenomenon is principally a function of blockage of sunlight by dust kicked up by large nuclear ground bursts and by smoke from fires set in cities.[8] However, traditional strictures for LNOs call for avoiding fallout (from ground bursts), direct civilian casualties (from attacks on cities) or large weapons in general anyway. Thus, without thinking of nuclear winter, we have long been making plans for limited nuclear options which largely avoided that danger anyway. Fear of it need change future LNO design little beyond traditional concerns for collateral damage avoidance.

Returning to our original question though--are their limited nuclear options in the sense used here?--that is to say, small nuclear strikes which avoid cities and which accomplish a significant military purpose? Much literature explicitly or implicitly denies that it is possible to do much more than send political signals with such options. Desmond Ball's oft quoted paper "Can Nuclear War Be Controlled?," directly states this.[9] Carl Sagan, one of the principal proponents of the nuclear winter concept, rather curiously claims that "Modern nuclear doctrines require that `war-supporting' facilities be hit...such facilities are, almost by definition,

[7] For a detailed statement of this calculation, see the appendix.
[8] Smoke can also be produced by nuclear-induced wildfires, but this is a lesser factor. See Turco, et al., op. cit., p. 1290.
[9] Desmond Ball, op. cit., p. 30.

cities, or near or within cities [emphasis added]."[10] Writing about nuclear winter, Thomas Powers, a contributing editor of The Atlantic, makes the even more questionable assertion that: "If cities are off limits, there's not much to use [nuclear] weapons on".[11] Perhaps most peculiar is the argument of Theodore Draper that, in considering the feasibility of LNOs, the question of use in remote regions should be dismissed. "The real problem is what to do about nuclear war in populated areas."[12]

The world would perhaps be a better place if limited nuclear options which did minimal collateral damage while having a large military effect (i.e., which met the dual criterion) were impossible. Indeed, one of the best arguments for carrying through on the President's Strategic Defense Initiative is not the hope of "Star Wars" systems which offer "leakproof" defenses of population--the possibility which has gotten the most public attention--but the hope for more limited (and more feasible) defenses which could fend off smaller attacks directed at military targets.

Unfortunately, until such defenses are available, in the real world there are some very attractive targets for LNOs. Some of these can be hit with little risk to population prima facie. Ships at sea (we have a total of 13 aircraft carriers, the Russians have two) and satellites in space are obvious examples of these. Others are soft fixed targets in the midst of large areas already essentially fenced off or remote from the public--space launch facilities, ballistic missile early warning radars, and major

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10 Carl Sagan, "Nuclear War and Climate Catastrophe", Foreign Affairs, Winter 1983/84, p. 261.

11 Thomas Powers, "Nuclear Winter and Nuclear Strategy", The Atlantic, November 1984, p. 35.

12 In his reply to Albert Wohlstetter in "Nuclear Temptations: An Exchange," The New York Review of Books, May 31, 1984, p. 50.

army and air bases fall into this category. These latter targets are becoming particularly amenable to limited collateral damage strikes as both sides deploy long-range cruise missiles which can have, for nuclear purposes, near perfect accuracy with relatively low yield warheads.[13]

Of note, these targets are neither silos nor cities, the two canonical types of over-simplified strategists. They are of the miscellaneous set known as OMT--Other Military Targets. As a group, they are relatively soft, and so they can be killed by relatively low-yield airbursts with relatively limited risks to civilians of either fallout, direct effects, or nuclear winter. With appropriate selection, the target set need not be very large. US ground forces in CONUS for reinforcement of Europe and/or the RDF are largely concentrated among some 17 Army bases which are the homes of 19 divisions.[14] Pact air power in Eastern Europe is largely concentrated *at some* 30-40 main operating bases.[15] Moreover, these "other military targets" are directly connected to the main purpose of military-oriented LNOs: effecting the course of an ongoing battle of primarily conventional forces. And there need not be high confidence of hitting each target in order to have drastic effect on the conventional battle. Destroying half of some group of conventional forces is by conventional standards a very large amount. "The Soviets define `annihiliation´ as 60 percent destruction of a given unit."[16] Unlike the more commonly considered counter-ICBM "First-Strike", one need not

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[13] US DoD, Soviet Military Power 1984, p. 37.
[14] US DoD, Annual Report to the Congress FY 1985, p. 115.
[15] Donald R. Cotter, "Potential Future Roles for Conventional and Nuclear Forces in Defense of Western Europe" in Strengthening Conventional Deterrence in Europe, Report of the European Security Study (ESECS), (New York, St. Martin´s Press, 1983), p. 224.
[16] Ibid., p. 227.

multiply the attack to insure against any reliability failures, and a few targets with especially high potential for collateral damage can be avoided.[17]

Specific examples of such limited nuclear options--their military purpose and their collateral damage consequences--are detailed elsewhere in Pan Heuristics' work for DNA. A couple of instances are worth citing, however. Some score of cruise missiles with warheads of appropriate yield could drastically set back operations of Soviet Naval Air bombers in the Mediterranean and Persian Gulf areas. Expected civilian fatalities might be on the order of 10,000. Missile-armed SNA bombers are the main Soviet counter to US carrier battle groups. Perhaps more importantly, if our carriers are destroyed (and they, themselves, may make a tempting target for a Soviet LNO), missile-armed SNA bombers could dominate the open oceans--unless faced with a credible counter-attack threat. At a slightly larger level, modern Soviet ICBMs could destroy the vast majority of the CONUS-based US tactical air force (some thirty wings) with expected collateral fatalities of on the order of one-hundred thousand. Not trivial certainly, but certainly very far still from an all-out war.

A second question basic to the concept of LNOs is that, even if it is possible to define significant nuclear strikes for each side which individually meet the dual criterion, will the process once started inevitably escalate to exchanges which do massive damage to civilians? Put more simply, will limited nuclear options stay limited?

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[17] Besides conventional forces, a second target set which may offer particularly attractive options for limited nuclear strikes may be each sides' major threat warning and attack assessment radars. These, however, can raise special issues of escalation risks and employment policy not addressed here.

As noted before, uncontrolled escalation is obviously not a danger if only one side has nuclear weapons. However, where both sides have them, there certainly are escalation risks. Harold Brown, in one of his Annual Reports to Congress, stated the view that:

> The odds are high, whether the [nuclear] weapons were used against tactical or strategic targets, that control would be lost on both sides and the exchange would become unrestrained.[18]

Analysts such as Desmond Ball argue further that:

> The likelihood that effective control of a nuclear exchange would be lost at some early point in a conflict calls into question the strategic utility of any preceding effort to control the exchanges.[19]

There appear to be three basic reasons for seeing escalation once nuclear warfare has started as highly probable if not inevitable: the fog of war, C^3 vulnerabilities, and an expected Soviet doctrinal penchant for larger options in any case.[20] The fog of war argument essentially holds that in the complex and confused situation of nuclear war, it will be very difficult to define mutually and to hold to precise escalation boundaries. Under such conditions, mistakes and misunderstandings will tend to snowball into larger and less constrained strikes. The evolution of British and German bombing exchanges from attacks focused on military targets (with explicit city avoidance) to attacks focused on cities was <u>in part</u> explainable by such a process.[21]

Compounding the danger of the fog of war preventing precise control is the vulnerability of both sides' command, control, and communications

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18 Harold Brown, <u>Department of Defense Annual Report FY 1979</u>, p. 53.
19 Desmond Ball, <u>op. cit.</u>, p. 37.
20 <u>Ibid</u>, pp. 30,37.
21 R.V. Jones, <u>Most Secret War</u>, (London, Coronet Books, 1979) pp. 176-177.

(C^3) to attack.[22] Obviously good C^3 is required for flexible and effective employment of LNOs. However, C^3 itself can be a very attractive target for LNO attack, degrading the other sides' capability to wage nuclear (or any other kind of) warfare. In turn the vulnerability of C^3 raises two further problems. First, degraded C^3 would be much less capable of seeing through the fog of war (and would be likely to make the mistakes that would create more fog). Second, fear of losing centralized C^3 might lead decision makers to early wide delegation of release authority for use of nuclear weapons if not to actually early launching of them. This in turn increases the danger of rapid escalation once things start.[23]

The third reason for thinking that limited exchanges are unlikely to remain limited is the argument that there is a Soviet doctrinal penchant to eschew small attacks for larger ones once nuclear war starts. This relates back to the first two factors, the fog of war and the attractiveness of C^3 as a target. The Soviet rationale seems to be that if nuclear war is very likely to escalate soon anyway, one is better off getting in a large strike first.[24]

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[22] John Steinbruner, "Nuclear Decapitation," Foreign Policy, Winter 1981-82, p. 18.

[23] Ibid.; and Paul Bracken, The Command and Control of Nuclear Forces (Yale University Press, New Haven, 1983), p. 201.

[24] Of course, it is possible that the Soviets' thinking allows for some limits to nuclear attacks, such as regional constraints, rather than the civilain casualty focussed dual criterion as defined here. As noted below there is some evidence for this. This possibility and its implications will not be directly addressed here except to note that once the Soviets are seen as accepting one limit, it makes it more plausible that they might accept another.

SECTION 3

THE ROLE OF UNCERTAINTIES

The issue of Soviet doctrine and its meaning is not a simple matter and it will be returned to later. However, two general points are worth making about the risk of escalation at this point.

The first is that the risk involved is not a simple one of some fixed probability of escalation once things get started. Rather it is a mixture of true uncertainties about the world (such as the effects of EMP), uncertainties about random events (such as mistargeting) and uncertainties about decisions which will be made in the United States and the Soviet Union. In turn these decisions will depend upon what alternatives the sides face--in part as a consequence of decisions they had made earlier including decisions to reduce the first two risks.

For example, in a recent PBS television program, Living With Nuclear Weapons, the possibility was brought up of a nuclear war starting accidentally when a tactical commander received a garbled transmission which he interpreted as permission to fire. Now one can argue about the a priori likelihood of this possibility. In fact, however, both the US and Soviet Union have taken steps to insure against it. They have created procedures to allow wartime dispersal of nuclear weapons while still retaining centralized positive control over launching authority. In the US case this is done with PALs (Permissive Action Links). PALs are combination locks on weapons which prevent weapons use without a code held by the central authority. Within any reasonable probability, such codes cannot be derived from a misunderstood transmission. In any event, both the US and Soviet systems allow for continued positive control by centralized

authority both in conventional war and in limited nuclear warfare.

The point of the foregoing discussion is that choices both sides make now will effect the choices available to them in a conflict and hence the danger of uncontrolled escalation. Other such choices include whether or not one depends on launch-on-warning for force survival, whether one targets or avoids the other sides' National Command Authority, and whether one designs one's targeting/forces/C^3 system to merely deliver a spasm strike or to fight a protracted limited nuclear conflict.[25]

Not only are there different types of uncertainties of escalation associated with LNOs, but the various types vary in their relevance for LNOs of various roles. For example, great uncertainities are now attached to the "Nuclear Winter" calculations. For the authors to get a nuclear winter from their small attacks discussed earlier, they had to make severe--but they thought not unreasonable--excursions from their base case assumptions.[26] The question of the reasonableness of the excursion is largely irrelevant, however, from the point of view of designing collateral damage avoiding LNOs as discussed here. As noted earlier, to even get in the vicinity of causing the nuclear winter effects they describe with a reasonably small strike, the strike must be directed largely at city centers. Independent of any considerations of nuclear winter effects, such a strike is unlikely to be considered for an LNO in the first place.

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[25] There may well be a major difference between protracted nuclear war in the sense of what happens after massive initial attacks and protracted nuclear warfare in which both sides try to maintain their massive retaliatory capability in reserve while engaging in a series of relatively small strikes. The latter case is both much easier to deal with and much more interesting in terms of the possibility of getting a relatively tolerable outcome.

[26] Turco, et al., op. cit., p. 1285.

Of more importance for our immediate concerns are such questions as will the Soviets engage in highly surgical limited nuclear warfare? Or would they, as many of their writings suggest, immediately launch a massive strike which, though counter-military in purpose, would incidentally cause massive civilian casualties? While this question will be substantively addressed later, the answer that we are substantially uncertain has quite different implications for US planning for LNOs of different purposes:

- o A strong argument <u>against</u> seeing "first use" LNOs as a solution to our conventional force weaknesses is that the Soviets might well escalate,
- o A strong argument <u>for</u> developing "second use" LNOs is that the Soviets certainly have the capability to make limited strikes, and thus they might well employ them (especially if we have no counter).

Still a third basic question is will the Pact or the West gain if a conventional conflict escalated to two-sided LNO exchanges? As a general note there has been amazingly little analysis of this outside the narrow context of specific theaters. The lack of analysis is a major point that will be returned to later. However, at the most general level, it is at least highly questionable that a two-sided series of LNO exchanges--even if it could be kept limited--would as a rule be greatly to the West's advantage. The basic reason for this is fairly simple. The West essentially represents a maritime coalition in potential conflict with a continental power. They will generally have more ground crossing points than we will have ports of debarkation and more airbases than we will have

forward airbases or naval aircraft carriers.[27]

The broad situation obviously provides more reason to fear limited Soviet escalations and less hope that NATO can escalate its way out of its trouble. Why is it then that NATO has been the Alliance so reluctant to adopt a No-First Use policy? Partially it is because one doesn't take the Pact pledge of no-first use terribly seriously. In turn that means that giving up NATO nuclear first-use would <u>not</u> free up large resources for conventional warfare--as will be discussed later we need them anyway to maintain deterrence of Pact nuclear use. Partially it is to keep the Pact uncertain of our policy and hence forced to act "nuclear scared" even in a conventional battle (as we have to).[28] Partially it also has to do with the peculiar place of escalation in the historical development of NATO doctrine.[29]

For a short time, originally, NATO had the goal of direct conventional defense against conventional attack. When the forces required seemed excessive to Finance Ministers, NATO evolved its long term policy for the fifties and early sixties, MC 14/2 or massive retaliation. Given the American nuclear advantage at the time, it seemed plausible then that the

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[27] This is, of course, not to say that a major nuclear exchange would be better for us than a limited one. The military balance might well get worse. The collateral damage potential would be much worse.

[28] As noted, as a general rule there is little reason to expect the West to gain much militarily through initiating a limited nuclear exchange. However, if the Soviets were reckless enough to bunch up their forces in a particularly vulnerable fashion to a nuclear strike, that might be an exception. This is the principle positive reason, which is more than a bluff, for planning a first strike.

[29] It is worth briefly noting the difference between a no-first use "pledge" which involves an unenforceable promise and a no-first use "policy" which indicates designing one's basic force and employment plans on the assumption of no-first use.

West's comparative advantage lay in escalating a battle to the nuclear level in a massive way.

This view largely lost its appeal to Americans, at least, as the Soviets began to increasingly get a secure second strike capability against the United States. In the Kennedy Administration, the concept was pushed of "flexible response". Originally that meant strengthened conventional forces and the development of more constrained but still war-winning nuclear options. There was indeed a great buildup in both "strategic" and tactical nuclear forces during the sixties (total number of US weapons peaked in 1967). However, there was little parallel buildup at the conventional level. To the contrary, US forces in Europe were being rundown by the pressures of Vietnam. Moreover, during the sixties the Soviets began a major buildup at both the conventional and nuclear levels, especially towards the latter half of the decade and into the seventies. Indeed, during this period of supposed Western shift from nuclear dependence,

> Measures of total combat potential, which take into account both numbers and quality of weapons, show that Warsaw Pact [conventional] forces in the Central Region of Europe have improved by more than 90% from 1965 to the present, while NATO forces advanced by less than 40%.[30]

While flexible response has always had many ambiguities, in the years after it was finally adopted by NATO in 1967, the switch from MC 14/2 to MC 14/3 has become in effect primarily one from deterrence of conventional attack by our ability to win at the nuclear level to deterrence of conventional attack through the threat of escalation itself.[31]

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[30] US DoD, Annual Report to the Congress FY 1985, p. 24.

[31] See Robert S. McNamara, "The Military Role of Nuclear Weapons", Foreign Affairs, Fall 1983, pp. 62-65, and The British Atlantic Committee, Diminishing the Nuclear Threat, 1984, p. 10.

Thus in the "traditional" NATO view of limited first use, escalation risk was to a large extent seen as a virtue. The traditional problem has been that that risk would scare NATO into preemptive surrender once a real conflict started or into preventative surrender once the manifold dangers of this policy were recognized (arguably a part of the anti-nuclear movement now).

SECTION 4

THE NEGLECTED DANGER OF SOVIET LNOs

There are three problems with depending on nuclear escalation as a way out of our conventional troubles. First, there is the danger that such an escalation could get out of control doing at least as much damage to ourselves as to our adversary. Second, there is the very real possibility that if the war stays limited, a limited nuclear war could well make things militarily worse than it had been with conventional weapons only. Third, because of the first two reasons weighing against nuclear escalation, the threat of it has an air of incredibility, of a lack of seriousness, that may encourage the other side to test our "bluff" with catastrophic consequences for us either way we go (either folding or carrying out the escalation).

Some analysts, such as McGeorge Bundy, George P. Kennan, Robert S. McNamara, Gerald Smith and Desmond Ball, have suggested that for these reasons we give up plans for the first use of nuclear weapons and use the money saved to build up our conventional capabilities.[32] The problem is, would giving up the first use option save us any money? As long as the Soviets have nuclear weapons we must deter their first use of them as well. Can we confidently deter their limited first use unless we have limited use options ourselves? If we must have such options anyway, is there any reason to expect that a second strike limited nuclear option capability will be any less expensive than what we have? To the contrary, taking seriously the problem of limited Soviet first strikes might well require some increase in our nuclear capability.

[32] McGeorge Bundy, et al., "Nuclear Weapons and the Atlantic Alliance," Foreign Affairs, Spring 1982, p. 759; and Desmond Ball, op. cit., p. 38.

On the other hand, there are three major arguments as to why we need not worry about limited Soviet first use if we give up the option ourselves. One is that the threat of an all-our response is an adequate deterrent. A second is that even if it started out with limited exchange, it would escalate to general responses soon anyway so as to make no difference. The third is that even if there was a theoretical danger of limited Soviet nuclear strike, in fact that would be a non-problem since limited strike would be against Soviet doctrine.

The problem with threatening a general nuclear response to a limited Soviet nuclear attack is the same basic one as depending on a general nuclear response as a deterrent to conventional attack. If the situation ever came about, we would much regret the policy, so much so and so seriously that the policy invites testing by our opponents and frightened protests by our public. Nor is the situation changed substantially by airy references to some impersonal process of inevitable escalation taking the decision out of our hands. As noted earlier, there are three essential arguments for inevitable escalation: fog of war, destruction of command-control, and Soviet doctrine. If one posits a limited Soviet attack, the last reason is obviously irrelevant (the plausibility of that posit will be examined in a moment). The first two, on the other hand, implicitly assume two-sided LNO exchanges. They don't apply if one side has forgone the limited option. If the Soviets have no fear of our counter-LNOs, and they deter a general escalation, they have little reason not to leave our command-control alone while destroying our forces. And the "fog of war" causing a gradual loosening of escalation boundaries requires that there be graduated options on both sides among which

There are two major negative effects that may come from an over-assurance on our part that the Soviets would never launch a limited nuclear strike. First, our vulnerabilities to such strikes ranging from our conventional forces to our strategic Tactical Warning/Attack Assessment systems may be neglected, potentially leaving us open to "cheap shots" which could be avoided through attention. Second, the assumption that we need only respond to massive attacks can lead to a certain laziness in designing our own nuclear forces and force options. The ability to launch militarily effective/collateral damage limiting attacks of our own after receiving a Soviet strike may seem less important. Even a policy like launch-on-warning may seem feasible if one accepts implicitly that any Soviet attack would be so massive that the chance of ambiguous warning would be small and so indiscriminant that we would not need to hold to adjust our counter-attack in light of what their strike does (either in terms of the specific targets they hit or the collateral "anti-targets" they avoided).

confusion can be generated. If we have left ourselves only the two choices of no response and general response, there is relatively little risk of losing that distinction.[33]

Would the Soviets ever launch a limited nuclear option? There is a broad belief that they would not though the matter is somewhat confused. First there is relatively little doubt as to their improving capability for such options both in forces and command-control.[34] Second, there seems to be indications that the Soviets recognize a distinction between attacks which land on the homelands of the two superpowers and those confined to third areas.[35] Finally, there is a long strain in Soviet military writing about the acceptance of political control of and limits on military options.[36]

Having said that, for no very obvious reason thought seems to have largely stopped. Even those specifically addressing the design of US limited nuclear options rarely seem to give attention to how countering Soviet LNOs might fit into some real contingency. Apparent Soviet doctrine against LNOs is no reason to tempt them to exploit their increasing capability. Even if we understand their current thinking (and they have many incentives to mislead us), if given sufficient opportunity and incentive they may change it--particularly if we build a force posture dependent on the assumption that any such move is impossible.

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[33] It should be noted that then Secretary of Defense Brown, immediately after warning of the high dangers of a series of limited nuclear exchanges escalating as quoted earlier, went on to emphasize that we should not count on that, and thus we nonetheless needed a deterrent limited nuclear capability. (Brown, op cit., p. 54).

[34] Brown, op. cit., p. 53, and Ball, op. cit., pp. 33-34.

[35] Stephen M. Meyer, "Soviet Theater Nuclear Forces, Part I," Adelphi Papers, No. 187, pp. 23-25.

[36] Presentation of N. Trulock at the European Institute for Security Research meeting of November 1984.

SECTION 5

DETERRING SOVIET LNOs

If we take the possibility of Soviet LNOs seriously enough to at least make sure we offer them no overwhelming temptations, what does that mean in terms of force design and employment strategy? As just suggested, one very important area is a review of the almost neglected subject of what the Soviets might accomplish with such strikes. This will hopefully lead to some suggestions for removing some of our more obvious vulnerabilities. Thoughtful contingency analyses are required but beyond the scope of this paper. However, some basic guidelines for such efforts can be set out.

First, as noted at the beginning, a principal goal of dual criterion oriented LNOs will be achieving maximum leverage on ongoing, primarily conventional battles. The purpose of such combat in turn will not be over direct Soviet versus US matters--they are unlikely to put priority on occupation of North America--but rather the Soviet Union's attempt to capture critical third areas and to keep us from effectively interfering. The analogy of the Japanese attack on the Pacific Fleet at Pearl Harbor--with the goal of clearing potential opposition to their occupation of Southeast Asia--was mentioned earlier. Likely areas of primary Soviet interest might be NATO Europe, the Persian Gulf, and/or Japan.

It follows then that conventional power projection forces are likely to be high priority targets for such LNOs. These are generally well set off from population in large military reservations. As compared to economic targets, their is much less intrinsic co-location with population. Effective small attacks on power projection forces can therefore be

designed to do relatively little collateral damage. Equally worth reemphasizing is their contrast with traditional "strategic" military targets, intercontinental nuclear forces and national C^3. Power projection targets are generally softer and less redundant. "Prompt" target kill, in the sense of minutes as opposed to hours is generally less important. On the other hand, tracking of moveable[37] forces will be important, but is is becoming more important anyway as the Soviets move increasingly to moveable ICBMs.

Further, attacks on power projection forces is not only easier and more directly addresses the original goals of the battle, such strikes by either side may also raise less risks of crisis escalation than concentrating targeting on "strategic" forces themselves or their C^3.[38]

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[37] In the sense of occassionally moved rather than anything like continuously mobile.

[38] A variation on this theme is targeting the Soviet power projection forces which threaten our strategic forces, particularly our SSBNs. This may be critical not so much to increase the survivability or endurance of our forces under current practices, but to make it safe for the SSBNs to alter their practices better adapting them for use in LNOs. This might include occassionally entering two-way communications with CONUS, and/or safely launching a portion of their missile load. Likely such SSBN-support targets would be Soviet ASW aircraft bases, ELINT satellites and satellite launch facilities, and ballistic missile tracking radars.

APPENDIX

The smallest nuclear exchange considered by Turco, et al., consists of 100MT divided among 1,000 100KT weapons airburst over city centers. To make the case "work" in producing a nuclear winter, Turco, et al., vary their baseline assumptions to increase smoke emission per area burned by a factor of about five.[39] By nominal estimates, how many direct casualities would be produced in any case?

[39] Turco, et al., op cit., p. 1285.

	Fatalities	Total Casualities
Blast Damage Criteria[a]	7 PSI	4 PSI
Casualty Area per 100 KT Weapon[b]	21 km^2	41 km^2
No. of Weapons[c]	1,000	1,000
Total Damage Area[d]	21,000 km^2	41,000 km^2
Urban Population Density[e]	4,000-8,000/km^2	4,000-8,000/km^2
Total Incidence[f]	~85-170 M	~160-320 M

Since "city centers" are assumed to be targeted in the Turco, et al., scenario, average population density could be expected to be towards the higher end of the range. This would suggest that the most "limited" case Turco, et al., consider involves exchanges with expected direct fatalities of over 150M and total casualties of over 300M.[f]

a] M. Drake, et al., An Interim Report on Collateral Damage, Science Applications, Inc., DNA 4734Z, October 1978, p. 5-108. Figures are for LD-50 and BD-50 overpressures for people in residential buildings.

b] S. Glasstone and P. Dolan, The Effects of Nuclear Weapons (US DoD and DOE, 1977), pp. 114-115. Overpressures for 7 PSI optimized height of burst are roughly interpolated and converted into circular areas. By way of comparison, Turco, et al., assume that 25 km^2 of built-up urban area is "burned" per 100 KT weapon (p. 1285). The Office of Technology Assessment suggests somewhat different casualty criteria leading to substantially larger equivalent casualty areas, roughly 26 km^2 for fatalities and 68 km^2 for fatalities plus injuries (using casualties as a function of overpressure from OTA and Glasstone and Dolan as cited here to derive effects area). See OTA, op cit., p. 19.

c] Turco, et al., p. 1285.

d] As in Turco, et al., overlaps and/or joint effects of multiple weapons are ignored.

e] H. Middleton, "Epidemology: The Future is Sickness and Death," in J. Peterson, ed., The Aftermath: The Human and Ecological Consequences of Nuclear War (Pantheon Books, New York, 1983), p. 52. Note that Middleton (p. 50) suggests using OTA casualty criterion cited above.

f] On average, deaths per 100 KT aimed at city centers of ~100,000 is not surprising in light of the estimate that the 12.5KT Hiroshima bomb killed 68,000 (Gladstone and Dolan, op cit., pp. 36, 544).

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